* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

CLAIMS

[Utility model registration claim]
[Claim 1] The damper which can carry out adjustable [of the torque of body of revolution] by making a rotor plate build in in the case which enclosed liquids, such as changing viscous liquid crystal or electrorheological fluid, by giving electric field, preparing one electrode in the rotor plate, fixing to the wall of a case, preparing the electrode of another side so that said electrode may be countered, and applying electric field to inter-electrode.

[Translation done.]

DETAILED DESCRIPTION

[Detailed explanation of a design]
[0001]
[Industrial Application]
It is related with the damper for easing the impact cut at the time of closing motion of the tape drawing door of a videocassette recorder, a camera, and an audio cassette deck etc., and the damper used for the speed control of rotation of a precision mechanical equipment.
[0002]
[Description of the Prior Art]
As a revolution damper using the conventional viscous fluid, as shown in drawing 2 , body of revolution 11 is inserted into viscous fluid 13, and to rotation of body of revolution, viscous fluid is resisting and is taking out the function of a damper. A resistance force is decided by the configuration of body of revolution, and viscosity of viscous fluid at this time.
[0003]
[Problem(s) to be Solved by the Device]
The force is needed for closing motion of a door as the conventional damper device being natural, when a resistance force is heightened, in order to make the impact generated when a door becomes tight ease since a resistance force is determined by the viscosity of viscous fluid and it cannot carry out adjustable, and closing motion speed becomes slow. Moreover, it is the force conversely small at the time of closing motion, and if closing motion speed is gathered, nonconformity, like the force which carries out impact relaxation becomes weak will occur shortly.
[0004]
[Means for Solving the Problem]
This design prepared the electrode in the case inside which enclosed the viscous fluid with which viscosity becomes high by giving electric fields, such as body of revolution and liquid crystal, or electrorheological fluid.
[0005]
The bearing of body of revolution has carried out the seal of between sheathing cases with the elastic body.
[0006]
[Example]
Body of revolution 1 is made with resin, and forms electrode 1a in the peripheral surface of body of revolution by paint of metal system ink. It paints in the upper and lower sides and the side-face location which counter the electrode formed in said body of revolution inside a case 2 in metal system ink selectively, and another electrode is formed in them. Spacing of electrode 1a of body of revolution and inside electrode 2a of a case was set to 0.3mm also with the upper and lower sides and a side face.
[0007]
Bearing of the body of revolution 1 is carried out by the pivot 5 which projected from the base, and this electrode 1a passes along the sealant 4 by the conductive elastic body, and he is trying to energize it on the outside of a case.
[0008]
NEMATEKKU liquid crystal was used for the viscous fluid used. When inter-electrode electric field gave 30V-200V for 50HZ and alternating voltage, running torque changed a maximum of 10 times.
[0009]
[Effect of the Device]
Since it is hypoviscosity when not giving electric field to inter-electrode, the torque of body of revolution is small and it is easy to move it from the conventional revolution damper. Electric field are given to the electrode by the side of body of revolution, and inter-electrode [of the sheathing case inside] at the time of impact relaxation,

and the viscosity of a fluid is raised. At this time, with impact speed, viscosity can be controlled by the height of an inter-electrode electrical potential difference, and it becomes the damper of the optimal impact relaxation.

[Translation done.]

*,NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

TECHNICAL FIELD

[Industrial Application]
It is related with the damper for easing the impact cut at the time of closing motion of the tape drawing door of a videocassette recorder, a camera, and an audio cassette deck etc., and the damper used for the speed control of rotation of a precision mechanical equipment.
[0002]

[Translation done.]

*,NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

PRIOR ART

[Description of the Prior Art]
As a revolution damper using the conventional viscous fluid, as shown in drawing 2 , body of revolution 11 is inserted into viscous fluid 13, and to rotation of body of revolution, viscous fluid is resisting and is taking out the function of a damper. A resistance force is decided by the configuration of body of revolution, and viscosity of viscous fluid at this time.
[0003]

[Translation done.]

*,NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

EFFECT OF THE INVENTION

[Effect of the Device]
Since it is hypoviscosity when not giving electric field to inter-electrode, the torque of body of revolution is small and it is easy to move it from the conventional revolution damper. Electric field are given to the electrode by the side of body of revolution, and inter-electrode [of the sheathing case inside] at the time of impact relaxation, and the viscosity of a fluid is raised. At this time, with impact speed, viscosity can be controlled by the height of an inter-electrode electrical potential difference, and it becomes the damper of the optimal impact relaxation.

[Translation done.]

*, NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

TECHNICAL PROBLEM

[Problem(s) to be Solved by the Device]
The force is needed for closing motion of a door as the conventional damper device being natural, when a resistance force is heightened, in order to make the impact generated when a door becomes tight ease since a resistance force is determined by the viscosity of viscous fluid and it cannot carry out adjustable, and closing motion speed becomes slow. Moreover, it is the force conversely small at the time of closing motion, and if closing motion speed is gathered, nonconformity, like the force which carries out impact relaxation becomes weak will occur shortly.
[0004]

[Translation done.]

* NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

MEANS

[Means for Solving the Problem]
This design prepared the electrode in the case inside which enclosed the viscous fluid with which viscosity becomes high by giving electric fields, such as body of revolution and liquid crystal, or electrorheological fluid.
[0005]
The bearing of body of revolution has carried out the seal of between sheathing cases with the elastic body.
[0006]

[Translation done.]

*.NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

EXAMPLE

[Example]
Body of revolution 1 is made with resin, and forms electrode 1a in the peripheral surface of body of revolution by paint of metal system ink. It paints in the upper and lower sides and the side-face location which counter the electrode formed in said body of revolution inside a case 2 in metal system ink selectively, and another electrode is formed in them. Spacing of electrode 1a of body of revolution and inside electrode 2a of a case was set to 0.3mm also with the upper and lower sides and a side face.
[0007]
Bearing of the body of revolution 1 is carried out by the pivot 5 which projected from the base, and this electrode 1a passes along the sealant 4 by the conductive elastic body, and he is trying to energize it on the outside of a case.
[0008]
NEMATEKKU liquid crystal was used for the viscous fluid used. When inter-electrode electric field gave 30V-200V for 50HZ and alternating voltage, running torque changed a maximum of 10 times.
[0009]

[Translation done.]

*.NOTICES *

1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DESCRIPTION OF DRAWINGS

[Brief Description of the Drawings]
[Drawing 1] Revolution damper sectional view
[Drawing 2] Conventional damper sectional view
[Description of Notations]
1 Body of Revolution
1a Body-of-revolution electrode
2 Sheathing Case
2a Sheathing case inside electrode
3 Liquid Crystal or Electrorheological Fluid
4 Sealant by Conductive Elastic Body
11 Body of Revolution
13 Viscous Fluid

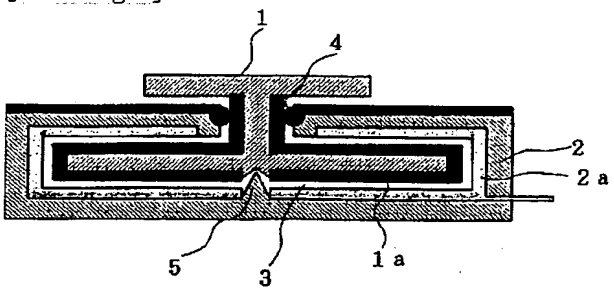
[Translation done.]

*.NOTICES *

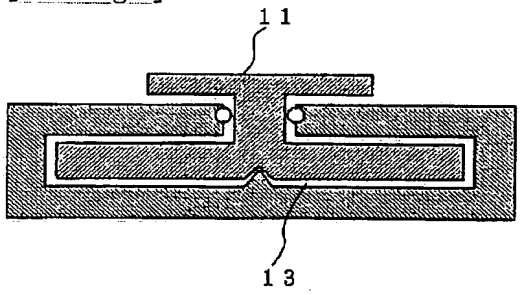
1.This document has been translated by computer. So the translation may not reflect the original precisely.
2.**** shows the word which can not be translated.
3.In the drawings, any words are not translated.

DRAWINGS

[Drawing 1]



[Drawing 2]



[Translation done.]

(19)日本国特許庁（ＪＰ）　(12) **登録実用新案公報**（U）　(11)実用新案登録番号

第3005263号

(45)発行日　平成６年(1994)12月13日　(24)登録日　平成６年(1994)10月５日

(51)Int.Cl.[5]		識別記号	庁内整理番号	Ｆ Ｉ	技術表示箇所
Ｆ１６Ｆ	9/12				
	9/53				
Ｇ１１Ｂ	33/02	５０２	Ｓ　7177－5D		

評価書の請求　未請求　請求項の数１　ＦＤ　（全 ４ 頁）

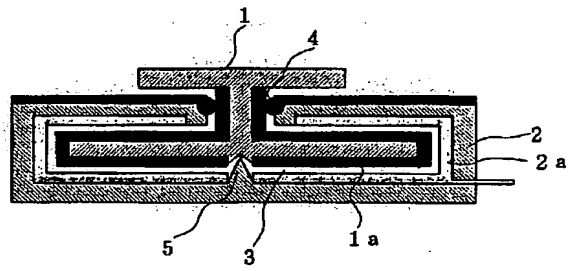
(21)出願番号　実願平6－8111

(22)出願日　平成６年(1994)６月15日

(73)実用新案権者　000237020
富士ポリマテック株式会社
東京都中央区日本橋本町４丁目８番16号
(72)考案者　城　島　寛　行
東京都北区田端５－10－10　富士ポリマテック株式会社テクニカルセンター内
(74)代理人　弁理士　松田　省躬

(54)【考案の名称】　可変減衰粘性流体回転ダンパー

(57)【要約】
【目的】　可変減衰できる粘性流体ダンパー。
【構成】　粘性流体の封入されたケース内に一方の電極を形成した回転板を、そしてこれと対向するケース内面に他方の電極を形成し、電場を与えることにより回転体のトルクを可変し、減衰させるようにした。



1

【実用新案登録請求の範囲】

【請求項１】　電場をあたえることにより粘性の変化する液晶又はＥＲ流体等の液体を封入したケース内に回転板を内蔵させ、一方の電極をその回転板に設け、他方の電極を前記電極に対向するようにケースの内壁に固定して設け、電極間に電場をかけることにより回転体のトルクを可変できるダンパー。

【図面の簡単な説明】

【図１】回転ダンパー断面図

【図２】従来ダンパー断面図

2

＊【符号の説明】

１　回転体

１ａ　回転体電極

２　外装ケース

２ａ　外装ケース内側電極

３　液晶又はＥＲ流体

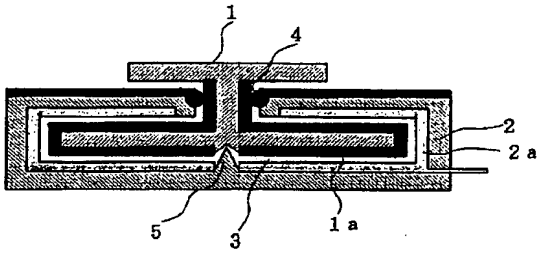
４　導電性弾性体によるシール材

１１　回転体

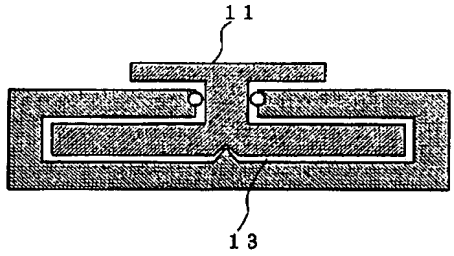
１３　粘性流体

＊10

【図１】



【図２】



【考案の詳細な説明】

【０００１】

【産業上の利用分野】

ビデオデッキ、カメラ、オーディオカセットデッキのテープ取出し扉の開閉時等におきる衝撃を緩和するためのダンパー、および精密機器の回転運動のスピードコントロールに用いられるダンパーに関するものである。

【０００２】

【従来の技術】

従来の粘性流体を用いた回転ダンパーとしては、図２に示すように、粘性流体１３中に回転体１１が挿入され、回転体の回転運動に対し粘性流体が抵抗となりダンパーの機能を出している。この時抵抗力は、回転体の形状および粘性流体の粘度により決まる。

【０００３】

【考案が解決しようとする課題】

従来のダンパー機構は、粘性流体の粘度により抵抗力が決定され可変できないので、扉がしまる時に発生する衝撃を緩和させるために抵抗力を高めると、当然のこととして扉の開閉に力が必要となり、かつ開閉スピードがおそくなる。又逆に開閉時に小さな力で、かつ開閉スピードを上げると、こんどは衝撃緩和する力が弱くなる等の不具合が発生する。

【０００４】

【課題を解決するための手段】

本考案は、回転体および液晶又はＥＲ流体等の電場をあたえることで粘度が高くなる粘性流体を封入したケース内側に電極を設けた。

【０００５】

回転体の軸受け部は弾性体にて外装ケースとの間をシールしてある。

【０００６】

【実施例】

回転体１は樹脂により作られ、回転体の周面には電極１ａを金属系インキの塗装により形成する。ケース２の内側の前記回転体に形成した電極に対向する上下

、側面位置には、部分的に金属系インキにより塗装して別の電極を形成してある。回転体の電極１ａとケースの内側電極２ａとの間隔は、上下、側面とも０．３ｍｍとした。

【０００７】

回転体１は、ベースより突出したピボット５にて軸受されており、この電極１ａは、導電性弾性体によるシール材４を通り、ケースの外側に通電するようにしている。

【０００８】

使用される粘性流体は、ネマテック液晶を用いた。電極間の電場は、５０ＨＺ、交流電圧を３０Ｖ～２００Ｖを与えたところ、回転トルクが最大１０倍変化した。

【０００９】

【考案の効果】

電極間に電場を与えない時は、低粘度であるため、回転体のトルクは小さく、従来の回転ダンパーより動きやすい。衝撃緩和の時に回転体側の電極と外装ケース内側の電極間に電場を与え、流体の粘度を上げる。この時衝撃スピードによって電極間の電圧の高低で粘度はコントロールでき、最適な衝撃緩和のダンパーとなる。